

Geometry

Chapter 11

Section 11-6

The three orange slices below were cut from three different oranges. Do you have sufficient information to tell which orange is the largest? If not, explain what information you would need.



A

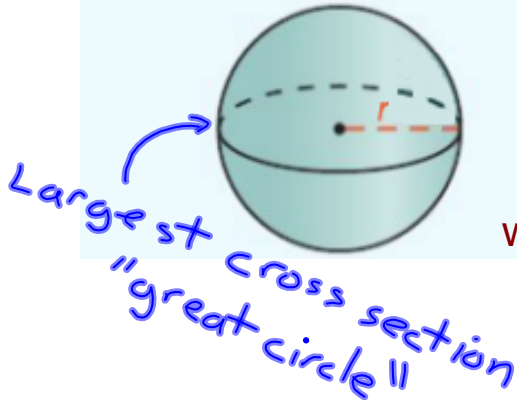


B



C

A **sphere** is the set of all points in space equidistant from a given point called the **center**. A **radius** is a segment that has one endpoint at the center and the other endpoint on the sphere. A **diameter** is a segment passing through the center with endpoints on the sphere.

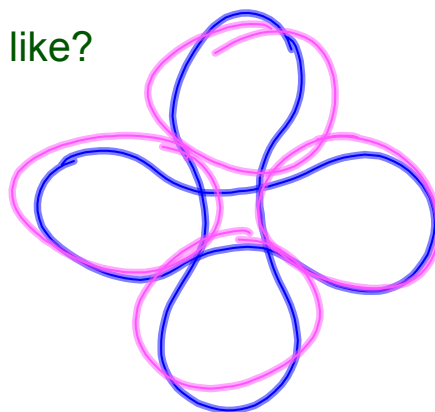


What is the cross section of a sphere?

Does your answer depend on where the cross section is taken?

Sphere Example: A Baseball

- Two congruent panels make up the outside of the ball.
- What do they look like?



take note

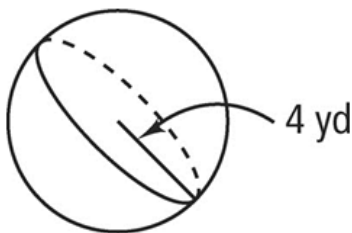
Theorem 11-10 Surface Area of a Sphere

The surface area of a sphere is four times the product of π and the square of the radius of the sphere.

$$S.A. = 4\pi r^2$$

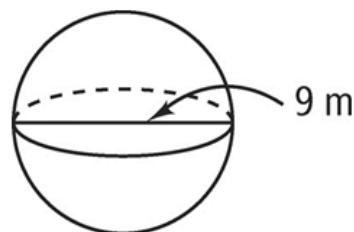


Find the surface area of each sphere.
Leave your answers in terms of π .



$$SA = 4\pi 4^2$$

$$64\pi \text{ yd}^2$$



$$SA = 4\pi (4.5)^2$$

$$= 2 \cdot 2 \pi 4.5 \cdot 4.5$$

$$9 \cdot 9 \cdot \pi$$

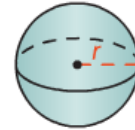
$$81\pi \text{ m}^2$$

take note

Theorem 11-11 Volume of a Sphere

The volume of a sphere is four thirds the product of π and the cube of the radius of the sphere.

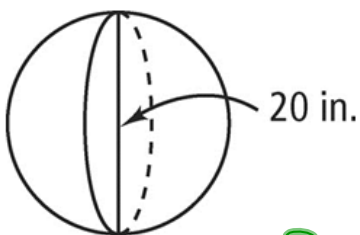
$$V = \frac{4}{3}\pi r^3$$



$$SA = 4\pi r^2$$

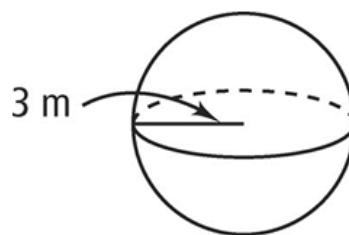
$$V = \frac{4}{3}\pi r^3$$

Find the volume of each sphere to the nearest tenth.



$$V = \frac{4}{3}\pi (10)^3$$

$$\approx 4188.8 \text{ in}^3$$



$$V = \frac{4}{3}\pi (3)^3$$

$$\approx 113.1 \text{ m}^3$$

Find the exact volume of a sphere with a surface area of $196\pi \text{ m}^2$.

$$SA = 4\pi r^2$$

$$\frac{196\pi}{4\pi} = \frac{4\pi r^2}{4\pi}$$

$$\sqrt{49} = \sqrt{r^2}$$

$$7 = r$$

$$V = \frac{4}{3}\pi(7)^3$$

$$457.\bar{3}\pi \text{ m}^3$$

or

$$457\frac{1}{3}\pi \text{ m}^3$$

Find the surface area of a sphere with a volume of 24 in^3 to the nearest tenth.

$$V = \frac{4}{3}\pi r^3$$

$$3 \cdot 24 = \frac{4}{3}\pi r^3$$

$$\frac{3 \cdot 24}{4\pi} = \frac{4\pi r^3}{4\pi}$$

$$r \approx 1.8$$

$$SA = 4\pi r^2$$

$$\approx 40.2 \text{ in}^2$$

$3 \cdot 24 / 4 / \pi$	5.729577951
$\sqrt[3]{\text{Ans}}$	1.789400458
$4\pi \text{Ans}^2$	40.23694064

Homework

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7 - 27 odd, 28 - 40 even